

4.6. FUELING STATION DESIGN

Management Measure for Fueling Station Design:

Design fueling stations to allow for ease in cleanup of spills.

Management Measure Description

The possibility of spills during fueling operations always exists, and spills of gasoline and diesel fuel during boat fueling are a common source of pollution in marina waters. Most fuel dock spills are small and result from overfilling boat fuel tanks so that fuel splashes back at the nozzle onto the deck, squirts out of the boat's air vent line, or drips from the nozzle as it is removed from the boat and returned to the fuel dock. Therefore, installation of equipment that can minimize the occurrence of spills and taking precautions to contain, absorb, and minimize the spread of petroleum products spilled during fueling operations in navigable waters are prudent environmental practices at all marinas.

Congress passed the Occupational Safety and Health Act (OSHA) to ensure worker and workplace safety. Their goal was to make sure employers provide workers a place of employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions. OSHA has various regulations governing employee involvement in spill cleanups, including requiring training for such activities. Facilities are encouraged to have employees attend hazardous materials handling training or other appropriate training.

A form of fuel loss that occurs rarely but is particularly damaging is when fuel leaks from fuel pipes and hoses between the fuel storage tank and the pump. This leakage can result from dock damage caused by a major storm or a collision involving a large boat. Because boat fuels are lighter than water, they float on the water's

surface and are easy to capture if spill containment and absorption equipment is readily available and used quickly.

The most effective way to minimize fuel spills and petroleum hydrocarbon pollution at a marina is to locate, design, build, and operate a boat fuel dock or station so that most spills are prevented and those that do occur are quickly contained and cleaned up. An essential step in spill prevention for both new and existing fuel docks is to identify and locate possible sources of leaks or spills, such as at joints in piping systems or between pipes and storage tanks, and to address each one in the facility's Spill Prevention, Control, and Countermeasures (or SPCC) Plan. An SPCC plan is a federal requirement (40 CFR Part 112) for any marina that has more than 660 gallons of petroleum in a single aboveground container, an aggregate of 1,320 gallons above ground, or more than 42,000 gallons under ground. The regulation requires that SPCC plans be certified by a professional engineer. Not all marinas are required to prepare and submit an SPCC plan, but if fuel is stored or transferred at a marina, even if only from a portable gasoline container filled at a distant gas station, being prepared to handle a spill is good environmental practice.

Oil is defined in federal regulations to include gasoline, diesel fuel, crude and refined oils, and petroleum-derived products like turpentine. Among the marine transportation-related facilities considered to have the potential to cause "substantial harm" to the environment are "onshore facilities capable of transferring oil to or from a vessel with a capacity of 250 barrels or more and deepwater ports." A barrel of petroleum contains 42 gallons, so 250 barrels translates to 10,500 gallons.

Rules for underground storage tanks (USTs) and UST systems (40 CFR Part 280) apply to all owners and operators of UST systems, except as noted in the regulations. Marinas with one or more stationary fuel storage tanks, above or below ground, with a combined storage capacity of 1,100 gallons or more of petroleum products are subject to federal and state bulk storage regulations for registration, testing, monitoring, replacement, reconditioning, closure, and/or removal. Fuel storage is also subject to other regulations, such as for occupational safety and fire. To ensure compliance with all applicable regulations, the state and local authorities should be contacted. Underground tanks with a capacity of 110 gallons or more are subject to federal underground storage tank (UST) regulations. UST regulations can be viewed on the EPA web site at www.epa.gov/swerust1/fedlaws/index.htm.

The location and design of fueling facilities also must meet applicable local, state, and federal regulations.

Applicability

This management measure is applicable to new and expanding marinas where fueling stations are to be added or moved.

Best Management Practices

- ◆ *Use automatic shutoffs on fuel lines and at hose nozzles to reduce fuel loss.*

A commercial fuel line shutoff can be located between the fuel storage tank and the dockside fuel pump. The shutoff automatically stops fuel movement when the system senses passage of a high volume of fuel through the line. The shutoff can also be manually closed when the fuel dock is not in operation or during emergencies. State and local codes might require shutoffs in specific locations.

Similarly, automatic shutoff fuel nozzles guard against overfilling boat fuel tanks by automatically stopping the flow of fuel from the pump. They are an excellent way to guard against spillage where marina patrons fill their own tanks. Fume return lines can also be used on automatic shutoff nozzles.

- ◆ *Remove old-style fuel nozzle triggers that are used to hold the nozzle open without being held.*

Old fuel nozzle triggers that hold the line open are illegal in some states because they can result in overfilling of fuel tanks and fuel loss out of air vents. Most new fuel nozzles automatically shut off when the tank fills. Check to see if the state you are in requires their use.

- ◆ *Install personal watercraft (PWC) floats at fuel docks to help drivers refuel without spilling.*

Special docking facilities for PWCs can be installed to stabilize them while they are at a fuel dock (Figure 4-13). Docking PWCs while fueling reduces fuel loss caused by the craft rocking on the water while fueling. These docks have proven popular with PWC operators and do reduce spillage.

- ◆ *Regularly inspect, maintain, and replace fuel hoses, pipes, and tanks.*

Regularly scheduled preventive maintenance is the best source control for fuel loss from the fuel storage and delivery system, and it is often less costly than cleanup costs and fines levied for spills. Many marinas are changing from underground storage tanks (UST) to aboveground, lined tanks. For EPA publications about USTs, call EPA's RCRA/Superfund Hotline at 1-800-424-9346 or visit the EPA web site at <http://www.epa.gov/swerrims/> (InformationServices link).

- ◆ *Install a spill monitoring system*

The U.S. Navy has designed a real-time monitoring system that can detect spilled crude and petroleum-based products 24 hours a day in any weather condition. The floating instrument detects sheen as well as emulsion layers below the surface, and it also determines the type of spill. Either the instrument is hardwired or the data from the instrument is telemetered to a base station, where associated software distinguishes between background levels and spills. The software can be set for continuous or discrete event logging data storage, and if a spill is detected, the base station automatically contacts authorities until a response is made.



Figure 4-13. Two PWC floating docks were installed at Winter Yacht Basin, Inc. (New Jersey). The floats are 4 feet by 10.5 feet and are connected to PVC pipes to allow them to ride up and down with the tide. Operators of PWCs can drive up onto the platform, step off, and fill the tank from the dock. The platform is stable enough to limit spilling during fueling. This practice has also decreased conflict between PWCs and larger boats at the fuel dock and has increased fuel sales at the marina (USEPA, 1996: *Clean Marinas—Clear Value*).

◆ *Train fuel dock staff in spill prevention, containment, and cleanup procedures.*

Marinas should have at least one key staff member fully trained and certified in spill management, and this person should be designated to be responsible for inspection, training, and control of any spill. Hazardous materials response training, such as 40-hour HAZWOPER training, is recommended. Contact the local agency responsible for hazardous waste response or a fire department for information. All staff members should know the location of absorbent materials and how to use them to remove the fuel immediately from the water or ground. Regular practice drills ensure that staff are familiar with the proper use of these materials.

◆ *Install easy-to-read signs on the fuel dock that explain proper fueling, spill prevention, and spill reporting procedures.*

Most states and some federal agencies have specific signage guidance. Signs with easy-to-follow instructions, perhaps using pictures, located on or near fuel pumps and fuel delivery locations can help expedite a cleanup if a spill occurs. It is

helpful to have signs that state the following information:

- Step-by-step way to fuel a boat
- Requirements of the law and spill reporting phone numbers
- Procedures to follow in the event of a spill
- Locations of absorbent materials
- Proper use and disposal of fuel-absorbent materials
- Warnings against the use of detergents or emulsifiers.

Spills should be immediately reported to either the U.S. Coast Guard or EPA. The U.S. Coast Guard is the lead response agency for spills in coastal waters and deepwater ports, and EPA is the lead response agency for spills that occur in inland waters. Oil spills can be reported 24 hours a day at 1-800-424-8802. On navigable waters, any oily slick or sheen must be reported. More information on laws and regulations related to spills can be obtained at the U.S. Coast Guard web site: <http://www.uscg.mil/>. EPA's web site for oil spill information is www.epa.gov/oilspill.

◆ *Locate and design boat fueling stations so that spills can be contained, such as with a floating boom, and cleaned up easily.*

A well-positioned and well-designed fueling station allows for spill containment equipment, such as booms, to be easily deployed to surround a spill and any boats that may be tied to the fuel dock if a spill occurs. Fuel storage tanks, the fuel truck delivery area, and pipelines that deliver fuel to the pump are also sites of potential spills. Facilities that can be set back from the water should be so placed, and spill prevention equipment located at all likely places where spills could occur (such as at pipe junctions). Many marinas are switching from underground fuel storage tanks to aboveground tanks because the latter make spill detection and control easier and the capital costs are lower.

When a spill occurs at the boat fueling station, there are three basic steps to take, which need to

be considered when planning or rebuilding a fuel dock:

- Report the spill to the proper authorities (U.S. Coast Guard, EPA, and the appropriate state agency). Any spill can be reported by calling the U.S. Coast Guard's National Spill Response Hotline, 1-800-424-8802. Any petroleum spill onto the navigable waters of the United States sufficient to cause a slick or sheen on the water is a violation of section 311 of the Clean Water Act and must be reported to the hotline.
- Contain the petroleum spill to prevent it from spreading. Put a boom around and confine diesel and other nonvolatile oils. The U.S. Coast Guard recognizes that gasoline spills pose an extreme explosion and fire threat and recommends that small gasoline spills be allowed to evaporate as quickly as possible without a boom placed around them.
- Place materials on the water within the contained spill area to absorb the petroleum. If the spill is large, a commercial spill clean-up contractor may be needed.
- Remove and dispose of the material at the appropriate time. Contact the local spill control authority, a fire department, or the

Cap Sante Boat Haven (Washington) uses oil absorption booms anchored cross-current to capture floating oil. The booms are changed twice a year. The marina also uses about 800 oil absorption pads a year at a cost of \$200. Battery Park Marina (Ohio) also uses an oil boom where the fuel line joins the floating dock, in case the connection leaks. These booms are replaced every 6 months at a cost of \$25 each. Cedar Island Marina (Connecticut) keeps a pole with a small floating absorption boom attached at one end on its fuel dock to be used quickly and effectively by staff to sweep and mop the water surface if any small spills occur during boat fueling (USEPA, 1996: *Clean Marinas—Clear Value*).

local U.S. Coast Guard for specific removal and disposal guidance.

◆ *Write and implement a fuel spill recovery plan.*

An SPCC plan is a first line of defense against petroleum pollution and should be developed by all marinas, whether required by regulations or not. An example plan is appended to the Petroleum Control Management Measure. An SPCC plan should be written to apply to all locations in the marina where fuel or oil is stored or transferred, and it should clearly explain spill emergency procedures, including health and safety, notification, and spill containment and control measures. Marina personnel should be trained in spill containment and control practices. The plan should address the following:

- *Who:* Clearly identify who is responsible for taking what action. Action items will include deploying the equipment and contacting the emergency agencies and additional cleanup services. The plan should contain a list, updated periodically, of emergency phone numbers to be used if a spill occurs. One person on the marina staff should be designated the official spokesperson for the facility.
- *What:* Define what actions should be taken if a fuel spill occurs and, based on likely threats, what equipment should be deployed. Include information on the type of spill equipment available on-site and its characteristics and capabilities. List emergency phone numbers to be called, including the U.S. Coast Guard and local fire department, when a spill is discovered. Make sure dispersants are *not* used on any spill.
- *When:* Clearly state when additional resources, such as spill control services, should be called for assistance. Plan when the marina's spill control equipment will be inspected and replaced, if necessary. A maintenance schedule for the equipment and a training schedule for staff should be established.
- *Where:* Show where the spill control material is located in the facility. Make sure storage lockers are clearly marked and easy to access. Identify sources where additional spill

response equipment can be obtained quickly if necessary. Potential sources include commercial spill response companies, fire departments, or neighboring marinas that have fuel spill response equipment. If a commercial fuel spill response firm is to be used, establish a prearranged agreement and cost estimates with the firm.

- *How:* Explain how the spill control equipment should be used and disposed of. To be sure that marina personnel understand the response plan, regularly conduct drills that simulate a fuel spill. Evaluate the drill and share observations with all employees.

State and local regulations might have broader applicability than federal regulations and might even require an SPCC plan of any facility where fuel is stored or transferred. Contact the appropriate state and local authorities to determine if the facility needs to have a plan and for assistance in preparing one.

An example of an oil spill response plan is contained in Appendix B. In order that it is clear what type of information is to be entered for the plan, the example is filled out with explanations of the information to be filled in or as if it were for an actual marina. Information specific to this fictitious marina is printed in Arial font. Where this font occurs, the entries should be replaced with information specific to the actual marina for which the plan is being written, and the plan should be updated as changes in procedure, regulations, or the marina occur. Oil spill information is updated quarterly in EPA's "Oil Spill Program Update" on the Oil Program web site at www.epa.gov/oilspill.

- ◆ *Have spill containment equipment storage, such as a locker attached or adjacent to the fuel dock, easily accessible and clearly marked.*

Store the appropriate type and quantity of fuel spill containment and control materials in a clearly marked cabinet or locker that is easily and quickly accessible at the fuel dock. The type and quantity depend on the type of spill likely to occur and the potential quantity of a spill. Place absorbent pads and booms, a copy of the SPCC plan, and other

important petroleum spill equipment in the locker. Effective fuel spill containment equipment is readily available from commercial suppliers. Booms can absorb up to 25 times their weight in petroleum products and float even when they are saturated. It's best to have enough length of boom to encircle the dock and the largest boat serviced, or a length of boom about three times as long as the longest boat serviced.

The following are examples of fuel/oil spill control products currently available:

- *Booms:* Usually 10-foot floating sections that interconnect to encircle the spill.
- *Pads:* Flat absorbent sheets that float; also called diapers.
- *Pillows:* Short booms often used in bilge of larger boats.
- *Bilge sock:* Small pillow for most boat bilges.
- *Filter:* Separates fuel from water.
- *Bilge switch:* Replaces float switch and shuts off when floating fuel layer is reached.

BMP Summary Table 6 summarizes the BMPs for Fueling Station Design mentioned in this guidance.

BMP Summary Table 6. FUELING STATION DESIGN MANAGEMENT**MANAGEMENT MEASURE:** Design fueling stations to allow for ease in cleanup of spills.**APPLICABILITY:** New and expanding marinas where fueling stations are to be added or moved.

ENVIRONMENTAL CONCERNS: Spills of gasoline and diesel oil during boat fueling are a common source of pollution in marina waters. Usually these are very small spills that occur from overfilling boat fuel tanks. These small spills may accumulate to create a larger pollution problem. The hydrocarbons in oil are harmful to juvenile fish, and to fish reproduction and genetics, and they interfere with the growth and reproduction of bottom-dwelling organisms. The oil and gas ingested by one animal can be passed to the next animal that eats it. In a marina, petroleum also deteriorates the white Styrofoam in floats and docks and discolors boat hulls, woodwork, and paint. Gasoline spills are also a safety problem because of the flammability of this product. The most effective way to minimize fuel spills and petroleum hydrocarbon pollution at a marina is to locate, design, build, and operate a boat fuel dock or station in such a manner that most spills are prevented and those that do occur are quickly contained and cleaned up.

FUELING STATION DESIGN PRACTICES

Best Management Practice Examples	Marina Location& Usage	Benefits to Marina	Projected Environmental Benefits	Initial Cost Estimate	Annual Operation & Maintenance Cost Estimate	Notes
Use automatic shutoffs on fuel lines and at hose nozzles to reduce fuel loss	Fuel hose nozzles; universally recommended	HIGH; automatic shutoffs prevent most back-splashing as tank fills; keeps fuel dock neater; reduces fire hazard	HIGH; greatly reduces volume of fuel spills from overfilling fuel tanks	LOW	NONE to LOW	A commercial fuel line shutoff can be located between the fuel storage tank and the dockside fuel pump; fume return lines can also be used on automatic shut-off nozzles
Remove old-style fuel nozzle triggers that are used to hold the nozzle open without being held	Fuel hose nozzles; universally recommended	HIGH; old-style nozzle triggers are illegal in some states	HIGH; greatly reduces possibility of fuel spills during filling; most fuel is spilled during tank filling, so this practice nearly eliminates this environmental impact	LOW	LOW	Replacing old nozzles is recommended
Install personal watercraft (PWC) floats on fuel docks to help drivers refuel without spilling	Fuel dock; generally recommended	HIGH; drive-on floats lift PWCs out of the water, stop vessel tipping, reduce spills, and increase fuel sales to PWC users; popular with PWC operators	HIGH; reduces fuel loss caused by rocking on the water, so less risk to the environment from fuel spills	MODERATE	LOW	Usually placed off to side where larger boats can't tie up; floating docks are available for PWC storage on the water
Regularly inspect, maintain, and replace fuel hoses, pipes, and tanks	Fuel storage area and fuel dock; universally recommended	HIGH; regularly scheduled preventive maintenance is the best way to prevent leaks from the fuel storage and delivery system; usually less costly than cleanup costs and resulting fines	MODERATE; reduces chance that persistent small leaks become a large pollution problem	MODERATE to HIGH	LOW to MODERATE	Biannually or more often, as necessary and prudent

BMP Summary Table 6. (cont.) FUELING STATION DESIGN MANAGEMENT

Best Management Practice Examples	Marina Location & Usage	Benefits to Marina	Projected Environmental Benefits	Initial Cost Estimate	Annual Operation & Maintenance Cost Estimate	Notes
Install a spill monitoring system	Fuel storage system and pipes; recommended	HIGH; automatic detection of leaks	HIGH; reduces chance of unnoticed spills, increases chance of early detection	MODERATE to HIGH	LOW	Easy to install; software is Windows 95/98-compatible
Train fuel dock staff in spill prevention, containment, and cleanup procedures	Marina wide for staff at fuel dock; universally recommended	HIGH; done annually or more often, can reduce fire and environmental hazards; response staff must be fully trained and certified in spill management	MODERATE to HIGH	LOW	LOW	HAZWOPER training is recommended; regular practice drills ensure familiarity with proper response protocol
Install easy-to-read signs on the fuel dock that explain proper fueling, spill prevention, and spill reporting procedures	Fuel dock on or at pumps; universally recommended	HIGH; inexpensive and effective way to educate customers and remind staff; customers want and look for guidance on how to fuel boats	MODERATE; signs increase chance of proper spill response and can ensure spills of different types (e.g., oil and fuel) are responded to properly	LOW	NONE to LOW	Check with local, state, and federal guidelines; USCG might have recommendations
Locate and design boat fueling stations so that spills can be contained, such as with a floating boom, and cleaned up easily	Boat fueling dock; universally recommended	HIGH; makes spill containment easier and faster; reduces liability and cleanup costs and fines	MODERATE; fast cleanup reduces environmental harm	MODERATE to EXPENSIVE	LOW to MODERATE	Location considerations: ease of spill response, convenience for customers, proximity to pumpout
Write and implement a fuel spill recovery plan	All marina locations where fuel or oil is stored or transferred; universally recommended	HIGH; required by state regulations; helps reduce liability in case of a fuel spill when coupled with annual staff training and good records	MODERATE; increases chance that a spill will be quickly and efficiently contained, reducing environmental impact	LOW to MODERATE	LOW to MODERATE if annual staff training is included	Staff training required; provide clearly written instructions for customers if self-serve fueling
Have spill containment equipment storage, such as a locker attached or adjacent to the fuel dock, easily accessible and clearly marked	Fuel dock; universally recommended	HIGH; keeping all necessary cleanup material in a locker ensures that the equipment is easily reached and used quickly after a spill	MODERATE; ensures quick response to spills; reduces potential of harm to environment	MODERATE	LOW to MODERATE, depending on frequency of spills	Check with local authorities for appropriate types and quantities

